

MASTER
NEGATIVE
NO. 93-81223-8

MICROFILMED 1993

COLUMBIA UNIVERSITY LIBRARIES/NEW YORK

as part of the
"Foundations of Western Civilization Preservation Project"

Funded by the
NATIONAL ENDOWMENT FOR THE HUMANITIES

Reproductions may not be made without permission from
Columbia University Library

COPYRIGHT STATEMENT

The copyright law of the United States - Title 17, United States Code - concerns the making of photocopies or other reproductions of copyrighted material.

Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or other reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of "fair use," that user may be liable for copyright infringement.

This institution reserves the right to refuse to accept a copy order if, in its judgement, fulfillment of the order would involve violation of the copyright law.

AUTHOR:

HEBBERD, STEPHEN S.

TITLE:

THE NEW PHILOSOPHY

PLACE:

[NEW YORK?]

DATE:

[190-?]

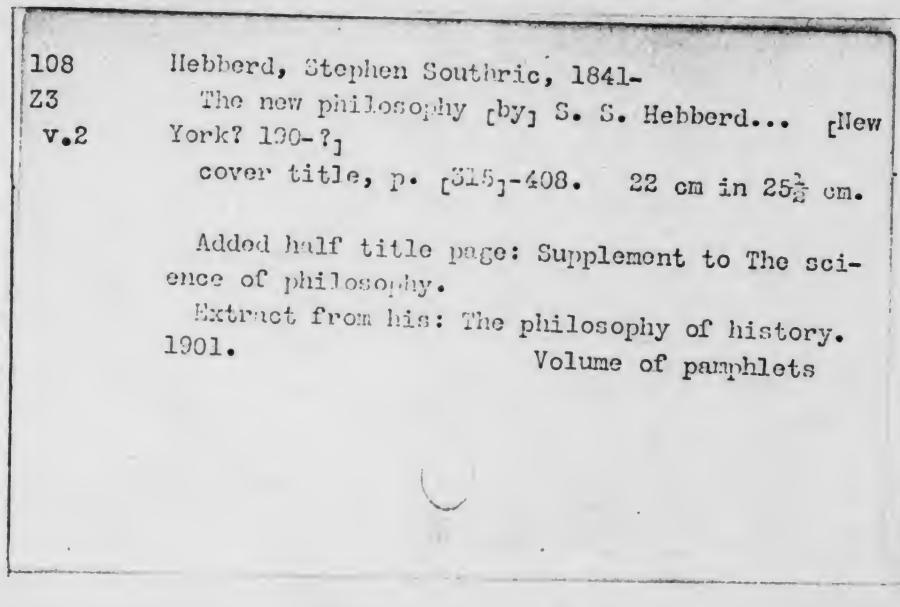
Master Negative #

93-81223-8

COLUMBIA UNIVERSITY LIBRARIES
PRESERVATION DEPARTMENT

BIBLIOGRAPHIC MICROFORM TARGET

Original Material as Filmed - Existing Bibliographic Record



Restrictions on Use:

TECHNICAL MICROFORM DATA

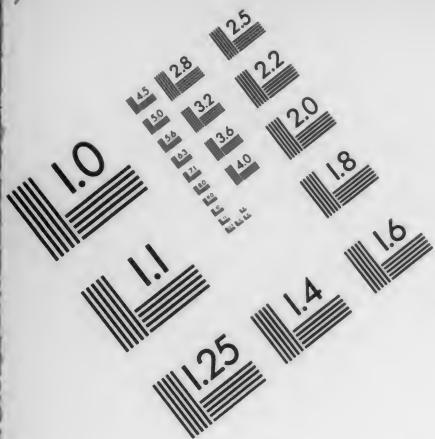
FILM SIZE: 35mm REDUCTION RATIO: 11X
IMAGE PLACEMENT: IA IIA IB IIB
DATE FILMED: 3-29-93 INITIALS BE
FILMED BY: RESEARCH PUBLICATIONS, INC WOODBRIDGE, CT



Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

301/587-8202





100

Power

No 1

THE
NEW=
PHILOSOPHY

S. S. HEBBERD,
CHESTERFIELD, ILL.

SUPPLEMENT

~~The Science of Philosophy~~

108
23
v. 2
(Ranp)
Philosophy

SEP 9 1907 Prof. J. McK. Cattell

March 1, 1924 Drew

THE SCIENCE OF THOUGHT.

Preliminary Observations.

Let it be well understood that I do not here pretend to construct a new system of philosophy. Such a construction will demand the work of many thinkers laboring throughout the present century of which I shall see at best but the bare beginning. My task must be confined to a rough sketching of the point of departure and the general direction which this philosophic development must pursue.

And at the outstart let me try to disarm one or two prejudices. A distinguished American writer has set it forth, almost as an axiom that it is a mere waste of time to seek for any really new system of metaphysics. That is certainly an amazing proposition. Thorough agnosticism, if not satisfactory, is at least intelligible. Possibly human reason will finally determine to abandon all search for a science of thought as hopeless. But to a believer in evolution it seems only foolishness to say that mankind is doomed to forever pursue paths of thought which have

been proved by the experience of three thousand years to lead only to endless and barren dispute.

But there is another kind of prejudice which I am far more anxious to disarm. It is that of genuine idealists who will probably scorn any criticism of their unscientific methods as an attack upon those eternal verities which idealism has sought to maintain. Those verities are as sacred to me as to them. The idealistic tendency which has been but a mere undertone for the last four hundred years, is to be the dominant note of human development during the present century and many others to come. That, it seems to me, is fully proved in the Philosophy of History. Criticism here is directed solely against the idealistic method in times past—the method of "Maya," of "transcendental illusions" and "phenomenality." This method seems to suppose that certainty is a sort of lump the more of which is subtracted from things seen, the more there will be to add to things unseen. But that is a grave mistake. All experience both in the Orient and the Occident shows that the final outcome of such a process is purely skeptical and pessimistic. And it is my hope to show here that what is really valid and valuable in idealism can be reached in a better way, by a strict inductive method and without affronting the primary convictions of mankind.

It would be very desirable too to disarm the

natural prejudice against the seeming "arrogance" of the claims here made. But that is probably impossible. Really, no one can be less disposed than myself to pretend to any rivalry with the great masters of thought, who saw so much amidst a darkened and generally pre-scientific environment. But, nevertheless, the old metaphysics is dead; in the process of human evolution the time has come for a new framing of our fundamental conceptions; and somehow it seems to have devolved upon me to begin the work.

Assumption not the Basis of Thought.

It seems best to begin by considering the chief objections which have already been urged against the fundamental principle underlying my Philosophy of History. And first of all it has been objected by an eminent educator and author that this principle amounts only to the familiar truth that we must assume a rational connection of things.

How easy it is to misunderstand! One main design of my work was to over-turn this whole theory of necessary assumptions lying at the basis of thought. That theory has played a great part—but an evil one, it seems to me—in all modern speculation. It has appeared in different shapes, in Descartes' doctrine of "innate ideas," in the Scottish dogma of intuitions, in the Kantian system of a priori forms and categories.

But in every shape the theory fails to accomplish the task for which it was set. It provides no solid basis of certainty. On the contrary, it discredits rather than guarantees our primary convictions. To say as Kant does, for instance, that we are mysteriously compelled by some peculiarity of our mental make-up, to believe certain propositions, is to instantly excite the suspicion that these beliefs are only subjectively true. They may be valid for us, and still only delusive and false. Reason cannot be really compelled except by a reason. How vainly Kant himself struggled against this "subjectivity" is well known, nor has any one since his day succeeded better. This curious wobbling of the mind between "the phenomenally true" and "the ontologically true," between believing and disbelieving the same proposition at the same time, seems to be the gist of modern philosophy.

For more than forty years this shuffling back and forth between two kinds of truth has seemed to me, not only logically but morally indefensible. All that time I have sought to find and elucidate some principle that would do away with these necessary assumptions. Surely there must be some better criterion of truth, some sounder basis of certainty than this motley crowd of intuitions, forms and categories for whose validity no other reason can be rendered than that they are compulsory beliefs. All the more when

it is confessed that they are not after all compulsory but can be easily set aside by distinguishing between two kinds of truth.

And now it is objected that this principle of mine is really nothing more than one of these familiar assumptions. Let us see.

That fundamental principle is that all thinking is a relating of cause and effect. In other words, causality is not merely one among the many categories of reason, but is the one implied in all the rest and from which all are derived. It is the essence of thought as distinguished from mere feeling. In fine every complete affirmation made by the mind is, either explicitly or implicitly, an affirmation of causality.

Of course this principle remains to be established. It is the object of this supplement to establish it—not deductively, for that would demand some wider principle from which it could be deduced, but inductively, by a strict examination of the various processes into which thinking divides itself. But if it can be thus proved, then it seems to me our present object is easily gained. We shall readily find an indisputable criterion of, not merely subjective, but objective truth. The existence of causal relations between all objects of thought will no longer be a mere assumption hanging in the air but a demonstrated truth supported by a very simple and cogent proof.

For if all thinking is a relating of cause and effect then the denial of causality logically involves the complete collapse of the whole thinking process. No matter in what form you put your denial, the same result inevitably follows. Do you say that causality is subjective and not objective? The answer is that both subject and object involve in essence the idea of causality and become empty words when that idea is cancelled. Or do you say that causal relations do not really exist? But to exist is, as I hope to show, to be in causal relation with somewhat or other, when that relation is cancelled, the word existence has lost its meaning. In fine, all propositions concerning the true or the false would become absurd; for, as will be shown when we come to treat of judgments, the essence of every affirmation is to affirm some causal relation between subject and predicate. Thus the whole fabric of thought would collapse, would fall into a tangled, useless mass like a fabric of cloth from which the woof had been withdrawn.

Perhaps this proof will be made clearer by noting its parallelism with that mathematical kind of demonstration called a *reductio ad absurdum*. The geometer sometimes proves his theorem by showing that its denial involved the denial of some universally accepted proposition; for instance, that the whole is greater than any of its parts. The demonstration in the present

case is even more thorough: for the denial of causality involves the denial not merely of some one particular proposition but of all possible propositions which the mind can frame. It involves the extinction of thought.

This proof is as yet hypothetical. It depends upon the establishment of my fundamental principle that all thinking is a relating of cause and effect. But even now it ought to be evident that my doctrine is not that of some "universal and necessary" assumption. It aims to substitute for that assumption a demonstrated theorem.

Note still further that in this argument I have simply made explicit what has always been implicit in the human mind. The belief in causality has always been something more than a mere assumption supported by naught but its alleged irresistibleness. From the beginning the human mind has been vaguely conscious that the denial of causality involved the collapse and extinction of all thinking. But the fact was not proved; and therefore speculation easily wandered off into the wilderness of Kantian subjectivity, etc. Nor can it be proved, I think, except through the recognition of our fundamental principle, to-wit, that all thinking is unitary, all its processes but more or less developed forms of relating cause and effect.

The Nature of Causality.

A second objection has been urged by others.

and with especial earnestness by a distinguished American writer who has written several very able works from the idealistic point of view. The objection is that I have confounded different kinds of causality.

To this I answer that distinctions are worthless when made at random and without regard to the real unity underlying them. And one chief defect of modern metaphysics is that it has blindly borrowed its distinctions of causality from the philosophy of a pre-scientific age. Wonderful indeed is the genius evinced in the Greek philosophy; especially the idealism of men like Pythagoras and Plato, belonging to a race saturated with materialism, seems almost a miracle of insight and beauty. But the defect of our modern speculation is that it has been little more than a revamping of this pre-scientific Greek philosophy—the ghost of it, so to speak. Hence our philosophy has never been able to really adapt itself to the revolution in thought effected by modern science. Especially in the present case, it has never risen above an ancient division of causes about as meritorious as the ancient division of the plant-world into trees, shrubs and herbs.

Hence I have sought to subsume these confused distinctions under that one uniform type of causality upon which modern science so strenuously insists. And the terms best fitted to ex-

press this common character inherent in all causal relations seems to be—a relation of dependence. How readily the various distinctions between causes can be assigned their true value by referring them to this relation of dependence, may perhaps be best shown by considering some of the aberrations of idealism and materialistic positivism in regard to causality.

(1) *Idealism.* One of the pregnant errors of idealism has been its failure to note the complexity of effects. Let the reader take this for granted, or otherwise seek for the proof thereof given in the Section of this Supplement dealing with Perception. At present I am interested only in the fact that effects are exceedingly complex, and that therefore we have many words with various shades of meaning to denote certain differences between the many causes upon which a given effect depends. Thus we speak of one cause as the *occasion*, as the cause most closely connected in time with the effect. Others we entitle *conditions*, as being more remote although often more significant. And one of these conditions which happens to be the most conspicuous, we are apt to designate as *the cause*. But the effect is dependent upon them all, whether called occasion, condition or cause. The shades of distinction denoted by the different terms refer merely to differences in the combination of causes; they do not essentially effect that com-

mon relation of dependence which binds the effect to all its conditions. And yet, as I hope to show hereafter, the idealistic theory of Maya or "phenomenality" is largely due to overlooking this complexity of the effect, to an arbitrary selection of some particular condition as the sole and sufficient cause.

Positivism. But we are also confronted by the positivist who affirms that causality and dependence are mere chimeras, that science deals with nothing except the uniform succession "of phenomena." But to such ones it is sufficient to answer that they seem not to have thoroughly considered the nature of those phenomena concerning which they discourse so freely. They have not seen that *every phenomenon is necessarily an effect*; it is some attribute or quality abstracted from a thing; and so long as sanity is maintained it can never be considered except as *dependent* upon that thing. So that the Positivist can not take the first step in his scientific observation of phenomena without being logically compelled to recognize relations of dependence.

But does the Positivist insist that although a relation of dependence in some sense must perhaps be admitted at the start, yet afterwards science has to do only with the regular succession of phenomena? I answer that under such an hypothesis he will make not much headway in scientific research. For the whole work of

science has consisted in showing little by little that every phenomenon is dependent not solely upon the thing from which it has been abstracted but also upon a vast variety of other things. Science is insight into this immense complex of relations of dependence.

The charge of ambiguity then, in my conception of causality has been more than disproved. Not only has it been shown that there is no such incompatibility between the alleged different kinds of causation, as would make it impossible to comprehend them in one genus. More than that, it has been shown that only through this generic or unitary view can we attain to any clear insight into the nature and validity of these distinctions.

The real confusion and equivocalness have been on the part of the old philosophy, which leaving these causal distinctions wholly vague and indefinite, has simply flung them all together in a witches' caldron of dispute and paradox.

Immanent and Dynamic Causality. This essay is but a tentative—a mere introduction to the Science of Thought; and therefore I shall attempt here to interpret only one of these distinctions. But it is the most conspicuous and vital one, and the one that will be most glibly urged against my theory of judgment and reasoning. It is the distinction between formal or immanent and efficient or dynamic causality.

In the Cartesian philosophy, especially as finally developed by the marvelous Spinoza, all the emphasis was laid upon causality as immanent. The type of the causal relations was the relation between a substance and its attributes, qualities, etc. That was a distinct advance, so far as it negated the pre-scientific Aristotelean view of qualities as themselves occult causes stowed away in things.

But after Newton's great discovery, we see the emphasis shifting to the idea of causality as force. The first stir of the transition is shown in Leibniz's Monadology. As it became more and more evident that the gist of science was insight into the motions of things the greater the stress upon this new dynamic view of causality. The type of the causal relation was no more the relation of substance and attribute as with Spinoza, but the relation of force to motion—force not immanent or fixed in things, but transitive, or rather transilient, leaping from object to object and thus producing these motions. And as the older view of causality culminated into Spinoza's materialistic pantheism, so the newer view culminated in the ideal or what would more properly be called the abstract pantheism of the Post-Kantian philosophy.

The dispute between these two modes of conceiving has done much towards bringing the question of causality into its present chaotic

state. Every tyro in philosophy knows what infinite confusion prevails. There are no definite and fixed distinctions; all is fluid, vague and vacuous. And yet from our present point of view it seems easy to so interpret these two apparently conflicting types of causality as to give to each an exactly definite value and at the same time show their generic unity.

Here, then, on the one side we have a relation of dependence between qualities and things; on the other side a relation of dependence between motions and things. The average professor of philosophy would remonstrate, off-hand, against confounding two such palpably diverse relations, the one merely "formal," the other "efficient" and "dynamic." But we remind him of the Conservation of Energy—of the scientific discovery that all qualities are ultimately reducible to and identical with motions. And then we ask: If attributes and motions are thus identical, how can their relations to things be so essentially different?

It is demonstrable then that there can be no essential difference in the two cases, although apparently so diverse. But what, then, makes them *appear* so diverse? I answer: because we are regarding the same relation from two different points of view. In the first case—that of substance and accident—we are regarding the *quality* mainly as dependent upon the thing from

which it has been abstracted, although perfectly aware that is also dependent upon other things. In the second case, we are regarding the *motion* mainly as dependent upon the other things, although perfectly aware that it is dependent also upon the thing it is abstracted from.

We have shown, then, both that the relation is identical and why it seems so diverse. The proof may be made clearer hereafter. But just as it stands, I think it will be clear and conclusive enough, except to those with whom imagination is so strong and reason so weak that they can think of force only as some sort of muscular pulling or pushing.

Reason and Cause. Let me also mention briefly the most pregnant of all such distinctions, that between cause and reason. Nowhere have I been able to find a clear-cut and valid account of the difference between these most significant terms; on the contrary, the utmost confusion and the wildest vagaries seem here to prevail. For example, an eminent and very thoughtful representative of the newest monism, defines cause as meaning merely motion, and reason as signifying "the forces of nature," such as gravity, elasticity, etc. The upshot of that would seem to be to make reasons the only real causes and to convert causes into mere effects, *i. e.*, motions. Many other examples of equally beclouded views might be given.

But one main design of this treatise is to draw a precise and unimpeachable distinction between cause and reason. A deep and exact difference, even opposition, between them—undisclosed in any previous system of speculation—will be demonstrated. And yet even here a unitary bond will be found.

The Fundamental Law of Knowledge.

That law is simply this: Causes can be known only through their effects, and conversely, effects can be known only through their causes. In other words we know the objects of thought only in their causal relations to each other. This law is an evident corollary from our fundamental principle that all thinking is a relating of cause and effect.

Let it be carefully noted at the outset that this law prescribes solely the *method* and not the *limits* of knowledge. Otherwise, the critic may see in it only a reduplicated form of the now prevailing agnosticism: thinking, it may be urged, is thus made to consist in the combining of two unknown quantities. On the contrary, our doctrine clearly understood puts an impassable barrier before the advance of nescience. For, it shows that all the easy inferences now current concerning "Relativity" and the "Unknowable" are based upon an entire misapprehension of what knowledge really is. Let us consider this.

The Fallacy of Resemblance. Thinking, as I hope to show, is under the law of evolution; it rises from the simplest causal judgments, little by little, by processes of composition and decomposition, to more complex and comprehensive judgments. But error also is under the law of evolution; all its fallacies are but more or less developed forms of the Fallacy of Resemblance.

Furthermore, the average intellect naturally inclines to judgments based upon mere resemblance rather than to causal ones. For, they are easier to construct. Man, like any other animal, is governed largely by the Law of Association—not, as many philosophers imagine, the association of thoughts but of feelings. Automatically, without any effort on our part, present sensations or feelings cohere with images of the past according to those rules of similarity which the Association philosophers have so laboriously expounded. This process of linking like to like goes on spontaneously; and thus a life of sentiency and suggestion is formed for us which does not differ essentially from the same life in horses or dogs. Attempts at thinking are so suppressed by association of similarities that our judgments, classifications and reasonings are very largely founded upon mere resemblances. The first and often the last interrogatory we propound concerning any object is: What does it look like?

The fallacy of all such judgments based solely upon resemblance is evident. They have inherent in themselves their own contradiction. For two objects are never so much alike as not to be unlike in some respects. So that we can say: "This is like that," and: "This is *not* like that," with equal truthfulness.

Judgment and reasoning from resemblance then, show themselves upon bare inspection as tending to fallacy. And yet they have always formed the main staple of metaphysical disputation. In dealing with the unseen, elusive phenomena of thought the temptation is almost irresistible to picture them, to clothe them in the shape and semblance of things, to appeal to the imagination and misleading analogies. Hence the midnight that has enveloped the leading problems of the mental life. Our essay will show how the great questions of Space, Time, Perception, Inductions, Self-Consciousness, and Causality itself have been converted into insoluble enigmas by this pictorial philosophy. It will show also that the only way out of this wilderness of "Relativity" and "The Unknowable" is through the recognition that all genuine knowledge of any object is a knowledge, not of its resemblances, but of its causal relations.

II.

JUDGMENTS.

To Judge is to Abstract. Prior to judgments there must be presentations of sense common to men and other animals, often given perhaps more distinctly and exactly to the mere animal than to the man. But the presentation is only feeling, not thought. It is possible, even common for us to gaze, to smell, to hear, to touch etc., and for the appropriate re-action to be given, to these stimuli, without any act of thought whatsoever. But the process of thinking or judging begins only with a conscious act of analysis whereby we abstract from the object presented, one or more of its attributes. No matter now what that presented object may be. Perchance it is but "Maya," or a transcendental illusion; that question does not concern us here.

Nor let any one cavil that we are here establishing an arbitrary distinction between feeling and thought. That objection comes with an ill-grace from any adherent of the old philosophies which have always hopelessly confounded feeling and thought, without a serious attempt to make any more than a purely verbal distinction

between them. But here we have a distinction perfectly clear, simple and precise. Furthermore, there are implicit in it the two other fundamental differences between thought and feeling: First, feeling is passive, while thought is active. The sensation of the color or the odor of an object is presented to an animal, even to a caterpillar perhaps as vividly as to us and it is instinctively attracted or repelled thereby. But thought is essentially active; it analyzes the object presented into two factors and observes the relations between them. Secondly, feeling is stationary; there is no possibility of developing what is purely passive and automatic. But thought is progressive; and it progresses for the very reason that it is abstractive. For, as I hope to show, this simple act of abstraction is the nucleus of all possible forms of mental development—the tie of consanguinity, so to speak, connecting the first perceptive judgments of the child with the most profound and universal judgments of science. Other items of difference between thought and feeling might be mentioned to the same effect. But these are enough I think, to show that we have here a clear-cut distinction furnishing a solid basis for a true science of thought.

Note now that we have in this primitive act of abstraction the perfect type of what we have declared at the outset to be the essence of all

thinking—to-wit, the establishment of causal relations. For, firstly, that which is abstracted upon must always remain absolutely *dependent* upon the object from which it has been abstracted. So patent is this that in all ages logic has issued an emphatic warning against the too common error of disregarding this dependence; of conceiving the abstracted element as having an independent, substantial existence apart from the object from which it has been abstracted. Secondly, even those philosophers who seem able to think only in figures of speech and are therefore most strenuous concerning the "efficiency" or "dynamism" of true, "ontological" causality must see that the object is certainly *one* of the causes upon which its attributes or properties depend. If not let them read again what was said a few pages back concerning immanent causality.

Thirdly, in this primary act of abstraction the demands of our Law of Knowledge are completely fulfilled: the causes cannot be known or even thought unrelated to its effects and conversely the effect apart from its cause. Manifestly the object is known only through the attributes abstracted from and dependent upon it. And conversely no one of these dependent attributes can be known or thought apart from the object; to try to think it thus apart—as independent and isolated—is confessedly one of the

most childish of logical errors. Each of the two factors, the object or that which is abstracted, is by itself but a semi-thought, fragmentary, senseless. Only when they are causally connected does a real and distinct meaning emerge.

Note now that the old philosophy has missed this insight through its passion for the fallacy of resemblance. It has seen the abstracted, the attribute only as something like a thing "inherent" in the object, sticking in it apparently like a pin in a pin-cushion. From that theory of "inherence" it is but a step to self-contradiction and ultimate skepticism. But from all this we are saved by simply thinking in terms of cause and effect.

(2.) *To Judge is to Experiment.* Philosophy heretofore has taken a very narrow and misleading view of experimentation as a rare and extremely artificial process, for the most part carried on only in the laboratories of the learned. On the contrary we are always experimenting whenever we are really thinking. For this work Nature has furnished the laboratory in our physical organism. She has provided in the organs of sense a wonderfully delicate and complex apparatus designed to present before us a particular phenomenon *isolated from modifying causes*. In vision, for instance, we see only the object; thus one cause of the vision is presented before us, isolated from the other agencies at

work, the aether waves, the nerve motions, cerebral changes, etc. If all these were perceived with the object, infinite confusion would result and knowledge be rendered impossible.

Furthermore, the variety of the organs enable us to vary the experiment. Through the sense of touch, for instance, we can experiment to see how the object behaves under one set of conditions; through sight, under another set of conditions; and similarly through smell, hearing, etc. Thus through a continuous process of experimentation we obtain those simple perceptive judgments with which the evolution of thought and knowledge begins.

Note further that the results thus attained are true *inductions*. For instance, an object is presented to sight and a particular color appears; the object is removed, the color vanishes. Or the object is touched with the finger, a feeling of resistance is felt; the object is touched no longer, the feeling disappears. In both cases we have used the "Method of Difference," which is universally regarded as the gist of the inductive process. But as common speech has confined the term induction to the forming of universal propositions, it is perhaps better to speak of these primary acts of abstraction simply as experimental.

(3). *To judge is to affirm existence.* In this I agree with some recent logicians who lay

much stress upon the "existential" aspect of judgments. But I wholly reject their interpretation and proof of this aspect. Here Mr. Bradley's strange juggling with such uncouth distinctions as "Thisness" and "This," may be passed over in silence. But a word must be said concerning a more seductive theory which regards the affirmation of existence as a sort of by-product of feeling—"the reality-feeling," "the feeling envelope of the presentation," etc. (1) That is not merely vague and inconclusive; it is a sheer plunge into the pit of mysticism. A feeling, so far from proving anything, does not even assert anything. It merely feels and responds automatically to the stimulus. A "feeling envelope" will no more justify our belief in reality than it will our belief in the equation of the cycloid. To overlook this, to subvert the distinction between feeling and thought, is to open the door to all fanaticism and vagaries.

There is a safer and solider ground than that for our belief in reality. The simplest, most primary judgment, as we have seen, affirms a causal relation; and in affirming that it affirms existence. For, whatever is a cause developing an effect, must exist in some shape or other. The nature of this existence is of course a matter to be determined hereafter.

(1) Baldwin. *Fragments of Philosophy*, 1902. P. 240. seq.

Furthermore, these same logicians have much perplexed themselves over this further difficulty: It is possible to predicate existence of a subject, and yet this predicate has no attributive content. But apply now our theory that the copula is simply a symbol of causal connexion. To affirm that "This is, i. e., exists," is then to simply affirm a cause without affirming any particular effect. Existence has thus been predicated of the subject and yet the predicate has no attributive content, it is left entirely indeterminate. Has not the difficulty vanished in a moment?

Qualitative Judgments.

Hitherto we have been regarding only the most primitive—what may be called perceptive judgments. In such judgments we seem to refer the predicate directly and almost exclusively to the subject; as, for example, where we affirm that "this burns," or "shines" or "moves," etc. But we soon see this exclusive reference of the predicate to the subject to be an error. We find that the predicate is dependent upon other conditions besides the subject from which it has been abstracted and to which it is attributed. The subject is not the sole cause, but a cause.

Qualitative judgments owe their origin, I think, to this advancing knowledge of the causal relation connecting the predicate with *other*

causes, besides the subject. When we affirm, for instance, that "this is red," we do not think of the predicate as solely an effect of the subject, but as something adjectival, added to and qualifying the subject. In fine, there is an implicit reference to the wider field of causality. This, I think, is the chief peculiarity in judgments of quality; in other respects they have the same three-fold character as the perceptive judgments already described.

Contrast now this theory of judgment with that of the old philosophies which have never been able to see in a quality anything much but its resemblance to other qualities bearing the same name. Firstly, the latter theory shows itself upon its very face to be vague and self-contradictory. Qualities although designated by a common name are rarely precisely alike in different things; in the same breath we may say with equal truthfulness that they are alike and they are *not* alike. Secondly, no relation between the predicate and the subject is exhibited except the absurd and impossible one of "inheritance." Thirdly and most important of all, Abstraction—the vital breath of all genuine thinking—loses its significance and is even put under suspicion as a breeder of vain subtleties. Hegel even wished to create a New Logic wherein "the barren abstract" should be replaced by "the concrete," by "the organic"—in fine, by a metaphor.

Quantitative Judgments.

(1). Quantitative judgments are affirmations concerning *abstractions*. Therein lies their essential difference from the judgments previously considered. In the latter, only the predicate is an abstraction and is directly referred to the subject from which it has been abstracted and upon which it depends. In the qualitative judgment, as we have seen, there is indeed an implicit reference also to other causes besides the subject which is partially disclosed in the very form of this predicate as an adjective and not a verb; but the paramount reference is to the subject. But in the quantitative judgment all this is changed. Therein we reach a more highly developed form of the judgment where both subject and predicate are abstractions.

It is true that this abstract character of the subject is not made very conspicuous in familiar speech. But let us not be blinded by a superficial similarity in form to a real and essential difference in meaning; that is to be victimized by the fallacy of resemblance. When we say: "This *rod* is five feet long," we mean that the *length* of the rod equals five feet. And in the more exact language of science judgments of quantity invariably assume this equational form.

But in thus defining judgments of quantity, have I not overthrown my fundamental principle that all affirmation is essentially an affirming

of a causal relation? By no means. On the contrary, the way has been prepared for exhibiting a new phase in that evolution of thought whereby we continually ascend towards a wider and at the same time more exact view of causal relation. Let us see.

(2). The abstractions which form the subject and predicate of a quantitative judgment are *abstractions from Space and Time*. And here we must hold in abeyance that ancient controversy over the ideality of space and time. That will be considered in due season. It is enough here to show that the two terms of a quantitative judgment are both abstractions from space or time, no matter what the latter may finally prove to be.

The old philosophy has not clearly seen this, because it has paid little attention to the most fundamental principle of all science—the complexity of effects. Take, for example, the distance of a given object. That distance may be said, in one sense, to be abstracted from the object; upon that it is dependent at least for its commensurability; an annihilated object would certainly be at no particular distance from the observer. But the distance is also dependent—and ultimately so—upon space; from that it was abstracted and without that it could not exist. And similarly with direction, figure and other spatial abstractions.

Or take the case of numerical abstractions or numbers. We affirm, for instance, that "there are seven sheep in the field." Now in a certain sense the number seven has been abstracted from the sheep; for we have gained it by abstracting from each sheep the attribute of one-ness or being a unit, and have added these units together. But in a far deeper and more pregnant sense, the number is abstracted from and dependent upon the existence of time; without its successive instants the numbering would be impossible. Countless examples might be given to the same effect. In all cases numerical abstractions are, in the largest sense and ultimately, abstracted from Time; and spatial abstractions from Space.

(3). This insight explains the well-known fact that the goal of science is *the transformation of qualitative into quantitative judgments*. For qualities are abstracted entirely from things; and therefore they partake, to some extent at least, of that infinite variability which attaches to things. There is no quality which does not hold within itself some shade of difference from a similar quality in another thing. But quantitative abstractions, as we have seen, are ultimately abstracted from space or time, both of which have absolute uniformity, unchangeableness and continuity. And because quantitative affirmations partake of this invariableness and

exactitude, it becomes possible for science to attain through them to universal judgments which are mathematically demonstrable.

Take notice likewise of the concomitant truth which has also just been shown. These quantitative abstractions are, in a secondary sense, abstracted from and dependent upon concrete objects. By remembering this science has been kept from losing itself in the wilderness of merely abstract speculation. It has always insisted upon verifying its splendid abstractions by showing their exact correspondence with the actual state of things in the world of sense. Thus our theory of quantity seems already to foreshadow and to explain that double crown of science—its two-fold capacity for inconceivably abstract speculation and for strictly verifying its conclusions.

It may not be amiss to add that our theory of quantity is fortunate in being apparently without a rival. The older logicians seem to have early given up the attempt to propound such a theory as hopeless; and Hegel finds it easy enough to show in his Logic that their definitions of quantity were but the baldest tautologies. True, Hegel has propounded a theory of his own in which he describes quantity as an early and crude phase of "self-negating negativity." But that fails to comply with a very modest demand which we have the right to make

of every theory: if it does not make clear what was dark, at least it ought not to darken what was clear.

Universal Judgments.

As yet we have treated only of particular judgments, but we come now to a still more difficult problem. How shall we explain and guarantee the validity of those universal judgments which form the substance of science, and yet seem to lie beyond the bounds of all possible experience? That problem, despite many earnest endeavors, has never been satisfactorily solved. It is the great scandal of modern logic that while every one is talking about the scientific method, no one seems able to give a precise answer to the question: What is the scientific method?

To prove this and at the same time to elucidate my own theory, let us consider the now most generally accepted exposition of the inductive process. It is Mill's theory of the Five Methods. Upon its very face this multiplicity of methods suggests a suspicion of empirical and unscientific explanation. But letting that go, let us examine the first two of these methods, they being confessedly the fundamental ones.

The Method of Agreement. This is but the vulgar method *per enumerationem simplicem*

with a very important proviso annexed. The proviso is that the enumerated instances should "have only one circumstance in common." But that stultifies the whole exposition; for, it is manifestly impossible when we observe many instances of an effect or rather of similar effects, to know that their antecedents agree in only one particular. Mill's restriction upon the vulgar method, guards against its abuses by making the method impossible.

Does some one urge that only material circumstances ought to be considered, those having some appreciably adequate power to produce the effect? But that would over-turn the entire method, and substitute for it something quite different and even contrary. The inquiry would hinge, not upon the number of instances, but upon the adequacy of the cause to produce the effect.

Note, however, that our quarrel is not with the method of agreement in itself. Used wisely, under the qualification just given, it leads in many cases to a sufficient degree of certainty. Our only objection is to the attempt to convert it—by foisting upon it an impossible condition—into one of the methods of scientific induction, which it is not.

The Method of Difference. Here we find the same impossible condition annexed as in the previous canon: there must be a "circumstance

in which *alone* the two instances differ." Let us consider the only example given by Mill in his exposition of the method: A man shot through the heart, dies instantly. Undoubtedly there is in this proof enough that in this particular case the death was caused by the wound. But what warrants us, in converting that particular judgment into a universal one? What enables us to infer that death is the invariable consequent of gun-shot wounds in the heart? Because, Mill asserts, all other circumstances were the same except the wound; "the man was in the fullness of life immediately before." But that we can never know except as more or less probable. Men apparently in the fullness of life, often drop dead without any perceptible cause. Even then in this extreme case, we must search for some other warrant for a universal judgment than that afforded by Mill's method.

The true warrant evidently is in our previous knowledge that such a wound is adequate in all cases to produce death. The injury inflicted upon the most delicate part of the frail bodily mechanism is so great that nothing could counteract the result. But if the wound had been on the finger, would we have framed a universal judgment therefrom? Would we not have said rather that death had been caused by fright, heart-failure or some other unknown cause? And so in all cases, I think, the real warrant

for the induction is in a previous knowledge for which Mill's canon makes no provision.

We dismiss then these famous Methods as merely annexing an impossible condition to the old empirical methods. And so we still have before us the problem of determining the essential distinction between scientific and merely empirical induction.

In the *Philosophy of History* the secret of the scientific method was stated as being a process of abstracting and accounting for the modifying causes. Some fifty or sixty pages were devoted to setting forth the historical evidence that all the physical sciences have had their origin in a developing comprehension of the complexity of effects—in a continuous discovery of modifying causes before unknown or disregarded. But we have now reached a point of view where it is possible to go still deeper and make an important addition to that statement. We can show precisely what it is that makes possible this scientific analysis of the complexity of effects. This inmost secret of the inductive method is its quantitative conception of force.

The Conception of Force. The term force, as commonly understood, is as vague as it is familiar. It is used as a loose synonym for power, efficiency or causality of any kind. But since the discovery of the first two laws of motion, a new scientific conception of force has gradually

developed which is as definite and exact as any other mathematical term. These discoveries made it possible to establish units of motion invariable in velocity and direction, and to analyze all actual motions, inconceivably complex and changeful as they are, into mathematical sums of such units, and the unit of force thus became whatsoever cause was adequate to the production of such a unit of motion. Thus the quantitative conception of force arose—a symbol for causality conceived as absolutely invariable and analysable into a sum of exactly equivalent units.

Note, now, first, that only through such a quantitative conception does the analysis of Nature's complex and ever changing effects become possible. The simplest calculations in arithmetic would be impossible, if the units used were variable. How much more impossible under the same supposition would the Infinitesimal Calculus become by which the astronomer analyzes the earth's motions, calculates the several influences of all the perceptible causes and sums them all up in a result minutely accordant with observation!

Secondly, this conception of force makes it possible to demonstrate the uniformity of causation. To see this it is only necessary to rightly distinguish between effect and cause. The observed effects are infinitely changeful; but in all these changes each still remains the product of

some definite sum of unvarying, equivalent units of force.

The Law of Physical Causation. See now how fully our fundamental Law of Knowledge is here vindicated. First, the cause is known only through its effects. Consider that widest of all scientific inductions—the doctrine of the conservation of energy. But what is energy more than an abstract expression for causality conceived as acting with absolute invariability or mathematical uniformity? Beyond that there is no knowledge of energy except through its results, to-wit, the motions it produces. True, many physicists like to think of energy or forces as immanent in things; nor is there any objection to that considered as a mere mode of conceiving—an expedient for calculating directions, etc., and an aid to the imagination. But there the true scientific spirit stops. To insist that we have any real knowledge of forces as little entities hidden in things and passing out of them—that is to be victimized by the fallacy of resemblance.

Secondly the effects are known only through their causes. The simplest motion conceivable is still a complex effect, dependent upon a moving thing, force, time and space; and how can we know or even think of it independently of these, its causal factors? Or take some more complicated case, the infinitesimal variations of accelerating motion, for instance; these defy even

imagination; the fact of their existence even was first discovered only by abstract reasoning from the thought of continuous forces. Or take the still more wonderful changes of motion into heat, color, etc. To humor the imagination we speak of these as transformations; and yet it is more than inconceivable, it is self-contradictory, to speak of the formless as changing its form. We know only that these abstractions are in certain definite causal relations with motions. So always and everywhere, the only knowledge of motion is a knowledge of that upon which motion depends.

Deduction. Little need be added here to what was said in the main treatise. The function of the syllogism is simply to unite and apply to particular cases the truths obtained by induction. Its art consists in remembering and using knowledge already gained, and its rigidly mechanical operations are very much like those whereby in animal sentiency a present sensation is fused with past images. In fine, the exaggerated importance generally attached to the syllogism is a striking proof of how entirely our modern philosophy has been but a revamping of the pre-scientific philosophy of Greece.

Note, however, that all long chains of reasoning naturally assume the syllogistic form; for, the syllogism is the instrument for combining and applying inferences. The inferences thus

united, however, are essentially inductive. In geometry, for instance, the main thing is to see at each minute step of the reasoning that what is true in the particular case presented in the diagram, is universally true; and that is induction.

III.
SPACE.

Confessedly, one of the most perplexing of all philosophic problems is that of space. To this problem I wish now to apply my fundamental law of thought, that all thinking is a relating of cause and effect, and that neither of these can be known except in relation with the other. On the one side we have some apprehension of infinite space; on the other, of the spatial properties of things, such as forms, distances, directions, etc. My *thesis* is that these two factors, space and the spatial attributes of things are related to each other as cause and effect. Space by itself is but a vague, elusive semi-thought which can be truly known or even thought of only through reference to the spatial attributes. And conversely, the attributes can be known or even thought only by relating them to that infinite space upon which they depend. And, I further hope to show that the obscurities and paradoxes enveloping the spatial problem have come from ignoring this fundamental law of thought.

The Kantian Theory of Space. Let us consider first the arguments by which this famous theory is supported by its author.

(1). Space, Kant first maintains is not derived by abstraction from particular external experiences; on the contrary the perception of objects presupposes the idea of space "as an intuition *a priori*, before all experience." The argument here is based upon a narrow and erroneous view of abstraction. We have now discovered and proved that in every abstracting act, the attribute abstracted is shown as dependent not only upon the thing or substance, but also upon other causes. In the case of spatial attributes this secondary ground of dependence is space. But how, it may be asked, do we get the idea of space? I answer that we do not get it apart as a distinct, isolated idea, any more than we get the isolated idea of the object or of the attribute. Taken thus apart each is but the fragmentary suggestion of an idea. What is a thing without a form? Or a form without a thing? Or space without spatial properties? But each becomes intelligible when united with the other in causal relation.

Without this insight, Kant finds it impossible to conceive of space except as a wholly magical creation of the perceiving intellect.

(2). Kant's second argument is that the notion of space is a necessary *a priori* idea, a pre-

condition of the possibility of all phenomena. As others have noted, this is nothing more than a new assertion of the thesis which the *Critique* purports to prove. But it gives me the opportunity for showing the exact point of failure in the Kantian solution of the problem—not only of space but of all thought.

That point of failure is that Kant made knowledge to begin with a blind, unconscious act. His necessary *a priori* ideas are mere assumptions necessitated by "our mental make-up"—compulsory, irresistible beliefs—affirmations which the mind is somehow mysteriously compelled to make without knowing any more why it makes them than a stone knows why it falls. And knowledge thus starting as a blind, mechanically determined activity, never afterward gains any other character. In the end, it confesses itself not to be genuine knowledge, but nescience, mere "phenomenality." We read again and again that Kant showed how knowledge was possible; he showed rather how knowledge was impossible.

And yet Kant was very near the solution of the great problem. In reducing to a system the mongrel crowd of innate ideas, necessary truths, intuitions, etc., imagined by dogmatic idealism, and in genetically tracing them back to some primary connection with the ideas of space and time, he was presenting the problem in so mas-

terly a shape as to make its solution seem not very far away. And it was, I think, this sense of a great problem *almost* solved, this expectancy of a light about to break forth, which gave to the *Critique* such a wonderfully fascinating power over human thought. Everybody, at least in Germany, thought himself competent to complete the master's work. But his "successors" failed—almost comically. And they failed, I think, because they did not have that full, clear view of the significance of the problem which Kant had.

For the present I content myself with stating anew this problem. It is to discover some other origin and basis of knowledge than mere assumptions which all men, blindly, without knowing why, are compelled to believe just as all stones are compelled to fall. But the Kantian philosophy merely gives us a reason for *not* believing what—as it asserts in the same breath—we are blindly compelled to believe.

(3). The third argument rests upon the supposition that space is a whole divisible into many parts. But upon this argument we shall not dwell, because we are to consider it later in its more modern form as the theory of space conceived as a sum of relations. Suffice it now that the great German here falls a victim to the fallacy of resemblance. He can conceive of space only under the similitude of a divisible

thing. But the very essence of space is to be indivisible, inseparable. Parts of space are pure figures of speech; and the only rational way in which we can think of any spatial property of things is simply as dependent upon space.

(4). Again space is infinite. But to know it as thus actually existent, one would have to count up, in Kant's opinion, the infinite number of its parts. But that would be plainly impossible in an ordinary life-time; therefore our knowledge of infinite space must be derived from some *a priori*, congenital "form of our sensibility."

But there would be no need of so much counting in order to discover that space is infinite, if one would discard the fallacy of resemblance and think only in terms of cause and effect. Then he would see instantly that all limitation of the extended depends upon and is made possible only by space. Whatsoever is thus limited, must have space beyond it. Therefore, if space is limited or finite it must have space beyond it; which is a contradiction in terms.

(5). *The Possibility of Mathematics.* The four arguments just given form the corner-stone of Kant's system; and yet he has presented them almost as cursorily as I have. But there is another argument upon which his heart was plainly set; especially in the Prolegomena he expatiates upon it at great length and lovingly. The argument is that only upon his hypothesis can

philosophic certainty be assured to mathematics. And if there is no other way, it would perhaps be well to give up the spatial world as a transcendental illusion in order to save mathematics and a part of morals.

But there is another way. It consists in resigning all hope of reaching real knowledge except by thinking in terms of cause and effect. Confining ourselves to the question of space, let us remember that the geometer demands only to be assured of the exact uniformity or unchangeableness of space. What is geometrically proved true here must be true—not, as Mill thinks, in a "a reasonable degree of adjacent cases"—but true everywhere even to infinitude. Nowhere must there be the most infinitesimal lapse in the immovability of space.

How, then, is this assurance of spatial continuity gained? I answer that it is implicit in all perceptions of moving things. Motion is a complex effect, dependent upon and inseparable from some moving thing, but also dependent upon the absolute fixedness of points in space. If there were no such unalterableness of the spatial points, motion would lack all determination of direction or velocity and therefore could never be known.

The fact just stated may be illustrated by means of a queer conclusion reached by Mr. Spencer, the great nineteenth century prophet of "The

Unknowable." He instances at great length the case of a man walking on a ship which is sailing in the opposite direction upon a sea which as part of the earth is being carried in still another direction, with several other complications. And he concludes therefrom that "our ideas of motion are illusive;" that even motion is unknowable. One might as well affirm that algebra was an unknowable, self-contradictory science because it insisted upon adding together plus and minus quantities. For the case given is merely that of a sum of motions which partially cancel each other. And the ultimate motion obtained by adding these plus and minus quantities would plainly be altogether unknowable and also impossible, if there were no fixed points in space. (1)

There is then no need of affirming the subjectivity of space in order to make mathematics possible. Thus the only argument upon which Kant seems really to have relied is obliterated.

It may likewise be added that there is no need of any other *a priori* machinery of innate ideas or intuitions to assure us that continuous, immovable space exists. That assurance is given by the logical process of abstraction—that essence of all reasoning—which proves to us that

(1) Spencer. *First Principles*.

every perceptible motion is an abstract from and dependent upon space.

There is, then, no good reason for accepting the Kantian supposition. But, it may still be urged, is there not at least a bare possibility of its being true? If not probable, is it not at least possible that space is but a product of our subjectivity? I answer: No! But the full demonstration thereof must be reserved to the next section, where we treat of perception. For the present let the following suffice.

Kant undeniably made a great advance upon the skepticism of Hume, when he showed that all the *objects* of thought or the understanding—Space, Time, the World, Substance, Cause, etc.,—were so closely interrelated that to deny one was to deny all. But he did not take the final step. He did not see that thought itself was so peculiarly interrelated with the objects of thought that to cancel them was to render all thinking impossible. This insight would have saved him from that pit of "subjectivity" from which he was always evidently striving to escape, but in vain.

The Argument from Interaction. But in addition to these Kantian arguments there are two others of a more showy, superficial kind, and therefore more current in recent philosophy. Both of them, as I hope to show, are products

of the fallacy of resemblance—that deep-rooted tendency of the human animal to think only in figures of speech. One of these arguments springs from the attempt to picture space in the likeness of things considered as interacting; the other, in the likeness of a thing as made up of a whole and its parts. Let us first examine the argument from interaction.

Let me present this argument in the words of an American idealist noted for keenness and vigor of thought: "Unless we endow space with activity and regard it as a peculiar something in interaction with other things the affirmation of its existence becomes absurd; and its existence would in no way be distinguishable from its non-existence." (1).

Such is the argument from interaction. How childish it seems! For, first, what is interaction but the production of motion. But motion has no meaning except as change of position in space. And so the argument reduces itself to this: Space does not exist because it does not change position in space.

Secondly. We are told that because space does not interact, its existence would be indistinguishable from its non-existence; space therefore is merely phenomenal. But in another place, the author argues that things likewise cannot in-

(1) Bowne. *Metaphysics* 129.

teract, and therefore they are merely phenomenal. This is the chief weapon of "critical" idealism—a preposterous hatchet with which it splits sensible reality into impossible parts and then easily shows that each of the dissevered parts is a ghostly illusion. It is of course impossible that either space or spatial properties or things should be perceptible apart from each other.

Thirdly. This argument from interaction shows upon its very face its descent from the fallacy of resemblance. Space in order to exist must be like things, must move and be moved; and because it is not thus like things, it does not exist. Such is the pictorial philosophy.

Space as a Sum of Relations. This argument has the same origin as the one just considered concerning interaction. Space is pictorially represented as an infinite thing divisible into an infinite number of parts. And as innumerable absurdities must inevitably result from such a fancy as that, space is once more dismissed as merely subjective, existing only "in and for the mind." Even the cool-headed Kant was led astray at this point and painfully pointed out that it would take too much time to count all this infinite number of parts and that therefore space must be an *a priori* form of intuition.

The persistent error in all such argumentations is the false assumption of the divisibility of

space. Space may be mentally analyzed, but it cannot be actually divided. Every one will see the moment he begins to reflect that the very essence of space is its absolute continuity. Bisect it and there is still space between the parts. In fact the very idea of division or separation involves that of space between the parts separated; for, if there were no space between, there would be no separation. Space may be analyzed; we can measure it by means of things used as units of measurement; we may imagine the space within a room as separated from that outside. But in all these operations space is mentally analyzed, not actually divided.

But that, it will be urged, is but a trivial distinction, a mere truism. And so it would be in the light of the old philosophy, which sees in mental analysis nothing more than a mental as distinguished from a physical operation. But we have now passed far beyond that naive view. We have gained a new insight into the deep meaning and universal scope of abstraction. We see that abstraction does not consist merely in mentally dividing or separating the attribute from its object but that it instantaneously puts them together again—unites them in causal relation to each other. *In fine, to abstract is to relate.*

To merely divide mentally leaves the divided halves as unrelated as the halves of a split log

are physically. And to that process the old philosophy has practically confined itself, in its view of abstraction. Let us apply this insight to the chief idealistic arguments concerning space relations.

(1). Spatial relations, it is said, have no independent existence of their own; therefore, they must exist only in and for thought, and so likewise must space, which is but their sum.

Non-sequitur. The premise is undeniable: the spatial form, for instance, which we abstract from any given thing has no independent existence. The form without the thing is indeed nothing. But likewise the thing without a form is nothing. Abstraction, however, does not consist in splitting a thing asunder into two nothings. It is an analysis of the thing into two factors conjoined with an instantaneous synthesis of these two as cause and effect. The abstract and the object abstracted from still exist indissolubly together and with the same common right to existence. If the thing is real, the form is real; and if the form is not real, the thing is not real.

Or to put it into a still simpler form, the whole idealistic argument reduces itself to this: Because an effect does not exist independently of its cause, therefore it does not exist at all. Such reasoning would lay waste the whole universe of thought.

(2). Another argument is, that the spatial relations of things are perpetually changing and therefore space, as the sum of these is perpetually becoming something else. The answer is that space is not a piece of patch-work made of an infinite number of parts. We must discard all such foolish imagery and look upon space scientifically as that upon which the infinite host of spatial abstractions, forms, places, etc., depend. And then, surely, it will be evident that a cause may remain eternally the same while its effects are incessantly changing because they are also dependent upon other conditions which are incessantly changing.

(3). Beside the actual, there are countless myriads of ideal and possible space-relations which things might have; these evidently are subjective, therefore so must space be, since it is but the source of them. But how utterly childish this appears when we no longer regard space as a sum of parts, but as that upon which all space properties depend! For, surely, it does not detract from the reality of a cause that there are 'myriads of ideal and possible' effects which it might produce under different conditions.

The Independence of Space. Another argument of Maya idealism is that the reality of space would involve a dualism of first principles

—two independent and infinite existences. But what compels us to believe that space is absolutely independent? Nothing but the tacit assumption—pervading all idealism—that whatever is dependent, is not real. But that assumption is not merely baseless, it is absurd. For if the dependent, the effects do not exist, then causes do not exist.

IV.

TIME.

Much of what has just been said concerning space applies to time, and therefore need not be repeated in this brief survey. I note here only a few neglected facts which put a new light upon the theory of Time.

The Pictorial Process. Nineteenth century metaphysics exhibits, even more clearly in its discussions about time than elsewhere, the wonderful vigor of the Fallacy of Resemblance even under conditions that would seem to render it impossible. Space readily lends itself to the uses of the imagination; nothing is easier than to think of space pictorially, as an airy sort of a thing capable of being divided into parts and re-united into a whole just like any other thing. But the surprising peculiarity of Time is that it absolutely refuses to submit to this picturing process. There are no possible images of it that do not manifestly contradict all its properties.

But despite this impossibility, imagination does manage to find some semblance of things

wherewith to picture time. How? Simply by borrowing, so to speak, second-hand images of space and absurdly transferring them to time. This attempt to understand time by means of spatial images leads to queer results. For instance, we often try to think of time as like a moving thing; it flows like a stream, etc. But time cannot move any more than it can stand on its head; present time is not "before" us for an instant, and it does not suddenly dart behind us to become past time. Or, seeing the folly of this we change the figure and think of time as stationary, as a straight line divisible into parts. This seems better as being more abstract; but proves to be really more self-contradictory and delusive. For the parts of a straight line all co-exist. But time is of such a nature that only the present instant exists; the past has become extinct and the future does not yet exist.

The quibbles and contradictions resultant from this pictorial view are too familiar to need rehearsal here. But note now the use that modern idealists have made of these puzzles. Seeing the contradictions and absurdities resulting from the attempt to find out what time "looks like," do they abandon such attempts? Do they simply draw the rational inference that time is of such a nature to preclude all picturing of it? No! on the contrary, they proudly present these

riddles as a demonstration that time does not really exist.

Time and Temporal Periods. But let us discard all these puerilities. Instead of trying to imagine what time looks like, let us interpret it simply in terms of cause and effect. We have, then, temporal periods—days, hours, instants, etc.—each presented in our conscious experience as a *complex* effect. Each is dependent partly upon our ever changing experience and partly upon the continuity and oneness of time. To the latter is due the absolute irreversibleness of these periods; to the former is due their particularity, their capacity for being analyzed—the days into hours, the hours into moments, etc.—in fine, the possibility of their being measured and recognized by thought.

Let us apply this insight now to that chief difficulty, that most formidable problem in the metaphysics of time over which philosophy was vexing its brains as hopelessly two thousand years ago as during the last century. Every thinker knows the problem by heart: the non-existence of the past and the future, the present a merely subjective boundary line no more really existing than the equator. But from our present point of view the problem is readily solved. Temporal periods are analyzable into past, present and future; for, they are abstracted

from, partially dependent upon and always measurable by the motions of things. But the time upon which these temporal periods also depend is indivisible. It is not a thing, a compound, a whole constructed out of its parts. On the contrary, it is, even more evidently than in the cognate case of space—absolutely one, continuous, indivisible. We may indeed properly in familiar speech, speak of time past, present or future, as we speak of the “rising” and the “setting” of the sun. But none the less, time is indivisible, continuous, without gaps, atomic structure or other semblance of a thing.

The problem of time, then, is simply dust which philosophy has thrown into its own eyes by its attempts to imagine what time looks like. The obscuration disappears when we think rationally—not metaphorically—of time as that upon which temporal periods depend.

Time and Interaction. But perhaps the old cavil will still be urged. Time does not interact with things. It is merely a condition, not the real and “efficient” cause of their motions. But what does science claim to know about this mystic “influence,” this “dynamic efficiency” supposed to pass from body to body and to thus produce their motions? Absolutely nothing except the persistence of its quantity through all apparent transformation. *And this persistence is*

determined solely by the invariable conditions of Space and Time. So that space and time seem to be the ultimate conditions upon which moving things depend not merely for a place and time to move in, but also for all we really know about those mystic influences which are alleged to be their only true and efficient causes.

V.

PERCEPTION.

Compulsory Beliefs. Let it be fully understood at the out-set that we shall make no appeal to any merely alleged irresistibleness of belief. Reason, as I have said elsewhere, is too divine to be compelled; it will listen only to reasons. In fact, an irresistible belief in this sense—a belief which we are mysteriously compelled to accept by something inherent in our mental structure or constitution—is an impossibility. The very fact that this belief is unaccountably forced upon us, excites the suspicion of its being merely subjective. We doubt it because we are thus compelled to believe it. Kant taught this to the world, although the teacher seemed sometimes hardly conscious of what he was teaching.

Hence the Scottish philosophy, with its lavish appeals to common-sense, irresistible beliefs, etc., failed utterly to find any real guarantee for objective existence. There is a vein of almost whimsical irrationality running through it. What

could be worse, for instance, than its plea that perception was "immediate," despite the immense and complicated mass of mediation which so evidently intervenes between the object perceived and the perceiving intellect. No wonder that Sir Wm. Hamilton was driven to the strange device of imagining the soul as somehow seated in both eyes and there inspecting the pictures painted upon the two retinas.

Discarding, then, all appeals to intuition, irresistible beliefs, etc., the question of reality narrows itself to this: How do we know that an outer, spatial world exists? My ultimate answer to this question will prove to be a very simple one. But before its full force can be appreciated, it is necessary to exhibit the sources of the confusion and perplexity which have so long enveloped this theme.

The Fallacy of Resemblance. That a thought should resemble a thing is an evident absurdity, an utter impossibility. And yet there is hardly any proposition which has come much nearer to being accepted by all philosophers as a "universal and necessary truth" than the proposition that our ideas of things must be like their objects. Especially has modern philosophy made constant use of this preposterous proposition as the entering wedge of skepticism. Locke began the work by discovering that our ideas of secondary qual-

ties could not be resemblances of what really exists in bodies, although primary qualities possibly might be. Berkeley developed this hint into his celebrated idealism. He shows that the primary qualitites are in the same plight as the secondary ones; points out the contradictions involved "in supposing things like unto our ideas existing without," and concludes therefrom that corporeal substances do not exist. Hume argues in the same strain. Kant carefully points out as the inmost distinction of his philosophy that he does not regard the space idea as quite "similar to the object," any more than he believes that "the sensation of red has a similarity to the property of vermillion which in one excites this sensation." (1) And so with Spencer, in fact with all idealistic or agnostic writers—never have I found one who did not sooner or later disclose the true basis of his skepticism as lying in the impossibility of ever finding out whether our perceptions really resemble the things perceived.

But we have now passed far beyond that aboriginal point of view. We see that there is not the slightest need that a thought should be like the object which it makes known to us. Thinking is not some mystic process of interior photography. A thought is a means, an instrumental condition for the disclosure of an object. But it

(1) Kant. *Prolegomena*. 13. Remark II.

is no more requisite that a thought in order to perform its functions, should be like the object than that an axe should be like the log which it splits or that a toothache should resemble the tooth that causes it.

Up to this point I have presented but a merely negative aspect of the theory of perception. A perception, whatever it may or may not be, is certainly *not* a picture. And if the reader fully grasps even this purely negative view, he will be surprised to find how much of the bewilderment and contradiction of current epistemology is escaped.

But something more than this merely negative view must, of course, be given. Otherwise we should seem to be accusing the great thinkers of the race of utter imbecility in having thus insisted upon what was self-evidently impossible and absurd—viz., that thoughts should resemble their objects. But this insistence was due not to pure folly, but to a logical demand for some insight into the method of knowledge. How, it was asked, can a thought give us any valid knowledge of a thing, if the one does not correspond to or somehow resemble the other? But evidently the required correspondence or resemblance between the idea and its object could be secured only by stripping the object of every spa-

tial quality—that is, of all that was essentially characteristic of things. Hence, idealism.

A False View of Abstraction. For a typical example of this let us take the teachings of Berkeley. Impartial readers can hardly help being puzzled by that author's serene and confident assurance that things are only "ideas." That to Berkeley seems to be an axiom, self-evident, indisputable. And if his axiom be conceded the rest of his philosophy naturally becomes very easy. Things being only ideas, of course they do not exist independently of the mind. The essence of being is to be perceived; the world does not exist when no one is looking at it. Even "the vulgar" understand by reality nothing but a regular succession of ideas in their minds. And so on and on, until the mystified reader begins to suspect some malformation either in Berkeley's brain or his own.

But the trouble is not so serious as that. Berkeley is simply the victim of a defective and delusive view of abstraction. To see that it is necessary to clearly understand what an abstraction is.

To abstract, as we have seen, in the section upon judgment, is to relate a cause and an effect. The object and its attribute are not split apart as with a hatchet; the one is not even subtracted from the other. But there is an analysis con-

joined with a new synthesis; the attribute—motion, for instance—has been abstracted from and yet is never to be considered as really separate from or independent of its object. There is also a second essential characteristic of an abstraction, its complexity; it is dependent not only upon the object from which it has been abstracted, but also upon other causes external to the object; it is indeed this secondary dependence which gives to the abstraction that wonderful wealth of meaning and power whereby it becomes the means of binding things with things in that vast network of causal relations revealed by science. But to avoid confusion, let us provisionally ignore this secondary dependence. Let us fix our attention upon its primary indefeasible dependence upon the object abstracted from. That at least is indisputable. Any attempt to think of motion or any other abstract as having a really independent existence of its own, would be a sure sign of insanity.

Now Berkeley, and idealists in general, do not indeed deny this dependence; that would be absurd. But they burrow under the fact and undermine it. They think of these abstracts—attributes, motions, qualities—as somehow having a vague, independent existence of their own; the object abstracted from is to them nothing but the *sum* of these airy abstractions. Thinking thus, it

is but a short step to the idealistic conclusion. These abstractions detached from all reality, floating in the void, elusive and evanescent—what more natural than to regard them as merely “ideas?” For do not “ideas” have the same ghostly and ephemeral nature?

Thus Berkeley and all other idealists—misled by a defective view which misses the most essential characteristic of the abstracting process—find it easy, even necessary, to believe that things are only “ideas.” They are the victims of a mental mirage which presents only abstractions, hanging in mid-air, unsupported and turned upside down.

Substance and Attribute. Of similar origin are the follies that have gathered around the conception of substance and attribute. What can be more grotesque than the idea of attributes “ inhering” or sticking in a substance like pins in a pin-cushion? Or of the substance as a mysterious, imperceptible substrate hidden beneath the attributes? How determined, too, each term in this strange relation seems to be to annihilate its correlate; the substance, we are told, is but the sum of its attributes; and the attributes are but mere abstractions.

But if we interpret the two correlates, not in figures of speech, but in terms of cause and effect, the perplexity disappears. When we ab-

stract an attribute from an object we do not divide them from each other or split them apart. On the contrary we bring them together, we relate them as cause and effect. Even if we abstracted a thousand attributes from a given substance, the substance would remain unimpaired and undiminished, and the attributes lose nothing of their reality in the process of being abstracted. In fine, the relation of substance and accident is the complete vindication of our fundamental law of knowledge; neither cause nor effect can be known or even thought disengaged from its correlate. A substance without attributes would indeed be a deep mystery. And an attribute without a substance would be a still deeper one. But unite the two in causal relation and each instantly illuminates the other.

Composite Pictures. Some thinkers have found in a recent photographic invention a new means of explaining and making plausible the ancient theory of abstraction as only a picturing of resemblances. General ideas, it is asserted, are produced in some such way as that in which a photographer produces a "composite picture." Images of different individuals are mechanically blended or fused; their differences are obliterated, a common type appears.

But these pictorial philosophers seem to entirely overlook the fact that composite pictures are

impossible except when the resemblance is very great and the differences almost indiscernible. Portraits vary but slightly in their outlines, and hence are readily fused into a common likeness. But who would attempt a composite picture of all triangles or of all motions? Or of all animals or plants? Or even of the arithmetical digits? No! the formation of general ideas does not consist in the mere effacement of differences. Every attempt to explain abstraction as solely a tracing of resemblances must end in the confusion and perplexity so characteristic of our modern philosophy.

The Complexity of Effects. Another superabundant source of idealistic error is the neglect of the scientific common-place that effects are complex. Discerning that the object perceived is not sufficient by itself to produce the effect, the idealist gravely announces that it is not necessary at all for the production of the effect and does not exist! Because colors, for instance, are dependent not solely upon colored objects, but also upon aether waves, nerve motions, cerebral centres, etc. therefore colored objects are needless. Because the effect is consummated by the abstracting mind, therefore it is independent of everything else.

I shall waste no time upon argumentation of

that type. Let us rather note that insight into the complexity of effects dispells that appearance of deceptiveness in perception which has always been the real stronghold of skepticism. The stationary appears to move, for instance, if we fail to take in account that essential factor in all observation, the position of the spectator. The very large appears very small, if we fail to take into account that essential factor in all perception of magnitudes, the intervening distance. And so everywhere scientific insight into the complexity of effects vindicates the truthfulness and exactitude of perception instead of reducing it to such a process of "phenomenality" and illusion, as idealism imagines.

The Kantian Doctrine of Phenomenality. This doctrine is the elaborate systematization of what has always been a favorite conception of minds of a mystical cast. It conceives of the world as a dream which all men are somehow mysteriously compelled to dream throughout their earthly lives. Here, again, the fallacy of resemblance is evidently at work; it is an attempt to explain reality by likening it to a dream, a hallucination or some other product of involuntary imagination. But what I wish to show is that this Kantian doctrine of phenomenality, plausible as it may seem to the thoughtless, is absolutely inconceivable. It is

devoid of something without which even dreams would be impossible. It lacks an element of sanity which is inseparable even from a madman's ravings.

For, let it be noted that Kant's doctrine of "phenomenality" makes not the least provision for any genuine causation. No more than Hume, can he find any real bond of connection between either things or ideas. There is nothing more than a subjective necessity of imagining causal relations which, instead of guaranteeing discredits their reality. Note further this fact which, so far as known to me, has been hitherto overlooked: Sense, understanding, reason in Kant's view of them, sink far below the level of the imagination in its craziest moods. No matter how monstrous may be the illusions presented to the dreamer or the madman, yet the bond of causal connexion between them is, *real*; they do not come at random; they unfold one from another with as rigid a continuity as do the movements of the stars. But in the Kantian world of phenomenality nothing is real. The interdependence of the phenomena is just as illusive as the phenomena themselves. Causation is merely a subjective necessity—*a dream about dreams*. Order and invariableness are equally illusive, since both Space and Time are non-existent. In fine, each phenomena, each evanes-

cent idea, is absolutely isolated, comes really at random, is really without any connection with the rest. Compared with this the madman's world is a cosmos.

Let then the idealist think intently upon this unassailable distinction. Let him cease to prattle about "fixed order," "invariable succession," etc., after he has by his hypothesis converted such words into symbols of mere delusion and unreality. Then he cannot but see instantly that phenomena in his sense of the term are absolutely unknowable. *They have not even that degree of intelligibility which attaches to the products of the imagination.*

Nor can the idealist escape by throwing Kant overboard like another Jonah. None of Kant's successors have made any better provision for the order and interdependence of phenomena than he did. In Hegel especially, causation was but a provisional, inadequate, "self-annulling" phase of thought—to be left behind as the notion moved on toward the Idea. That, indeed, is the fatal error of all Post-Kantian idealism. As has been abundantly shown in the Philosophy of History, the essence and life of the idealistic impulse is its emphasis upon causality. The dogma of "Maya" or "transcendental illusion" is but an accident, a disease to which idealism is peculiarly susceptible. Post-Kantian idealism has flung

away the essence, the life, but kept the accident, the disease.

Finally, the dogma of "phenomenality" renders all real knowledge impossible by destroying the distinction between truth and falsehood. Its teaching is that an enormously successful lie is a kind of truth, and the only kind of truth of which we have any genuine knowledge. But that is high treason against good morals as well as reason. It puts all human knowledge of existence upon a lower level than the hallucinations of the madman. For, first, it exploits the former as being a more universal, gigantic and irresistible imposture than the latter; secondly, it denies to our human world-view that element of truthfulness which is to be found, as we have shown in the preceding paragraph, even in the ravings of the insane.

The Demand for Unity. The more one examines the grounds on which the doctrine of the world's ideality rests, the more he is surprised at their inadequacy and airiness. Hence we instinctively feel that there must be some weightier reason for this long persistence of a paradox that seems to hang upon such a brittle thread of argument. There have been, perhaps, several such reasons, but chief among them is the demand for unity. The human mind demanded that even in the pre-scientific age; and now more than ever.

But philosophy has sought this unity by a wrong method—through the fallacy of resemblance, by ignoring the differences and magnifying the likeness of the objects. Thus comes materialism crying thoughts are but pale copies of things; and also idealism crying that things are but “externalized” pictures of thoughts. But instead of unity we get thus only endless contention over what is really little more than a question of nomenclature.

The only true unity is the unity of dependence. Objects the most diverse—even things and thoughts—may be related as cause and effect; in fact, they are thus being related in every moment of genuine thinking. There is no need of painfully paring down either of these contrasted elements into a delusive similitude of the other. There is need of gradually disentangling, by a strict scientific method, the immense complex of causal relations until we reach that Ultimate Unity on which all else depends. This is the only sane monism.

The Ultimate Doubt. We have thus examined—in this section and the two preceding ones upon Space and Time—the arguments for modern or agnostic idealism, and traced them all back to a few primary errors into which the human intellect seems very prone to fall. So far as positive arguments are concerned, agnostic idealism

seems to have no standing-ground; any positive proof or even indication of the world’s “phenomenality” appears to be lacking.

But there still remains a negative argument, venerable and formidable. Must not all our knowledge, it will be asked, ultimately rest upon some unverifiable assumption? And does not every assumption carry with it some suggestion, some probability of its deceptiveness even though there may be no proof or even indication thereof? And does not this ultimate dubiety attach itself especially to the senses? May not perception after all prove to be merely a universal dream? Could not Infinite Power produce our sensations, each in its order, without the intervention of a spatial world and organs of sense?

I begin my answer to these questions by pointing out that no real knowledge is based or can be based solely upon an unverifiable assumption. And under that term must be included all such nondescript phrases as “self-evident truths,” “intuitions,” irresistible beliefs, etc.; for, they differ only in name; no new certainty is gained by the easy process of declaring a given proposition to be “self-evident.” No real knowledge, then, can be based upon an assumption. This wide prevalence of a contrary opinion is but a survival from a pre-scientific age, when induction was misunderstood and when reasoning

meant only a deducing of some proposition from a more universal one, and that from a still wider one, and so on up to "self-evident truths," or unverifiable assumptions. But we now know that knowledge begins with inductions; and that the starting-point of an induction is not an assumption.

Precisely in this inductive way we began. The proposition that all thinking was a relating of cause and effect was set forth as something to be proved by an inductive examination of the various processes of thought. And we have found that every form of mental activity—perceiving, abstracting, conceiving, judging, the simplest inference, the most universal of scientific inductions, the recognition of Space and Time—has for its essence the establishment of some causal relation. Eliminate the causal element from any act of thinking and it loses forthwith all its meaning, its life. Thus a wonderful interrelation, a common kinship, is proved to exist between all activities of thought. All, from the simplest and most rudimentary to the highest and most complex, are found to be but more or less developed forms of a single process.

Through this inductively established principle we hope to give a final answer to the question above presented. In other words, it is this solidarity of thought which renders doubt concern-

ing the reality of the spatial world logically impossible. Let us see.

The Final Argument. My thesis is this: *Thought is so interrelated that the negation of the spatial world logically involves the negation—the collapse and extinction of all thinking.* The demonstration thus becomes that known to all mathematicians as the *reductio ad absurdum*. There is a difference, indeed, but one that serves only to give a greater potency and sweep to our argument. The geometer shows that the negation of his theorem leads to the overthrow of some accepted principle of thought. Here it is to be shown that the negation of the spatial world logically leads to the overthrow not merely of some particular principle, but of all principles of thought—to the collapse of all thinking.

(1). To begin my argument, the first fact to be proved is that we have no knowledge of any particular perception apart from our knowledge of the object perceived. Of course, the average psychologist will wave this affirmation aside with a derisive smile. He has always been in the habit of claiming the most transparent knowledge of his thoughts apart from everything else. All his teachers and books have been quite unanimous upon that point. Concerning his knowledge of external existence he is modest enough;

but for him no other spot was ever so brightly illumined as that which he calls his "field of consciousness." And yet if he will think intently instead of blindly following the ruts of tradition, he cannot but see instantly that there is no possible knowledge of perceptive thoughts apart from knowledge of objects perceived.

For assuredly to know an object we must know at least some of its attributes. But the peculiarity of sensations or perceptions is that they have no distinctive attributes of their own, known to us. We distinguish a particular sensation from all others, not by its own attributes, but by means of the attributes of the object revealed by that sensation. For instance, is the sensation of heat itself hot? Or the sensation of roundness, itself of a round shape? Or when the sensation of red "rises above the threshold of consciousness," is it painted of a red color? Or does the interior sensation of a mal-odorous substance itself have a bad smell? Such questions seem almost silly in their simplicity. And yet a clear apprehension of the answer to them would work miracles of renovation in our modern psychology. At least it would prove to all what is here being contended for: to-wit, that there is no possible knowledge of our particular sensations apart from a knowledge of their objects.

(2). Even those great groups into which sen-

sations are divided can be discriminated from each other only in the way above described. We distinguish between sensations of sight, sound, smell, etc., through attributes either of their objects or else of the organs of sense definitely located in space, never through any non-spatial attributes of the sensations themselves. The latter remain and must ever remain shrouded in mystery.

It may be objected that we can discriminate between feelings of pain and of pleasure without reference to any spatial quality. But that exception serves only "to prove the rule." For perception proper occupies the neutral ground between pain and pleasure; whenever either of these feelings is very intense, the perceptive functions are retarded and impaired.

(3). Perceptions and spatial objects perceived are so closely interrelated that without knowledge of the latter, there is no possible knowledge of the former; and that for the simple reason that perceptions have no discernible attributes of their own by which they can be discriminated, known, or even thought. That proved the remainder of our task is easy. For perceptions, as we have seen, are the primary units out of which reason develops all its other processes. By memory we simply recall what was once perceived; by imagination, voluntary or involuntary, our memories

are combined; by abstracting, judging, reasoning, we analyze and re-unite what was given in perception. So strict is the inter-relation between all our mental activities. Hence we conclude that if the negation of the spatial object logically involves the negation of the perceptive act, it also involves the negation of all other mental processes. The whole fabric of thought dissolves.

(4). Carefully note, however, that our argument refers only to the *spatial* attributes of objects. Science is now fully convinced that all merely qualitative relations are derivative from and reducible to spatial or quantitative ones, although it has not yet completed their reduction. Therefore our task here is much simplified. We have to prove only of the spatial attributes that their cancellation would make all knowledge impossible.

The splendid genius of Kant divined that the problem of Space was the key to all metaphysics. But perplexed by the obscurities enveloping the space-idea, he worked out the easier, skeptical solution of the problem which led to nothing but nineteenth century agnosticism. But against this view we have now raised an impassable barrier. Every attempt to prove the ideality of the spatial world has been shown to stultify itself — from the start. For, it makes thoughts even

more delusive and unknowable than things. In nullifying the spatiality of the object it takes away the only means of discriminating one thought from another. Thus reason is converted into chaos. Questions concerning existence or non-existence, truth or falsehood become absurd. Thinking has been rendered logically impossible.

The Appeal to Consciousness. Do you then repudiate, it may be asked, that testimony of consciousness which gives so clear an insight into our mental operations? No! but I repudiate that worn-out trick of proving sheer assumptions by alleging that we are conscious of them.

Such disingenuous follies do indeed seem to be bringing consciousness into disrepute with many. One of the most eminent of American psychologists wrote a few years ago: (1) "Every one assumes "that we have direct introspective acquaintance with our thinking activity as such. Yet I must confess that for my part I cannot feel sure of such a conclusion." But there is no need of going to that extreme. In fact, the very thesis we have just been contending for, instead of ignoring consciousness, rather defines it and describes its real functions. As the fine philological instinct of the race divined in framing the word, consciousness is concomitant knowledge. In

(1) James. *Psychology.* (B. C.) p. 467 Also p. 215-216.

every perceptive act, for instance, knowledge is gained of some object perceived and along with it a collateral knowledge of the mental operation of perceiving. Take away the first and the collateral knowledge vanishes of course. And that is largely the gist of our thesis: cancel the spatial object and knowledge of thoughts is rendered impossible.

VI.

SELF-CONSCIOUSNESS.

Nowhere, perhaps, has the fallacy of resemblance had such scope as in speculations concerning self-consciousness. The difference between the two rival theories upon this subject seems to reduce itself entirely to a choice of metaphors. On the one side we have the party of Hume, who describes consciousness as a series of ideas, a flowing "stream" of thoughts. That simile throws not one ray of light upon the subject; rather it seems to be devised for the special purpose of concealing everything characteristic of our consciousness. The figure of a flowing stream as we have seen, is misleading even when applied to a succession of events in time; but far more so when the essence of each event is to remember the rest. On the other side, we have the Post-Kantian philosophy teaching another doctrine, but by precisely the same metaphysical method. Thus in Hegel's view, exclusive emphasis is laid upon the self, that is, the ego, "the Idea" *externalizing* itself. But when is an idea inside and when outside itself or anything else?

So self is pictured as *opposite* to and confronting itself, like a maiden admiring her image in a mirror. And then after a while space itself is interpreted as this opposition between the "empty subject" and an "empty object." Thus the metaphor works both ways: first, consciousness is explained by a supposed analogy to space, and then space is interpreted by a supposed analogy to consciousness.

But we have now passed beyond this pictorial philosophy. We interpret consciousness not by metaphors, but in terms of cause and effect. To be conscious is to be aware of the causal relation between the thinker and his thought.

And here our fundamental law of knowledge vindicates itself grandly. First, we can know the cause only through its effects; the ego by itself is but a half-thought, elusive, non-descript; in vain we try to see what it looks like, to describe it as a simple substance, to interpret it pictorially; it can be known only by its effects, by what it *does*. Ignorance of this fact led to Kant's mistake when he declared the self to be "the emptiest of all notions," or when he entered upon his famous but futile tilt against the soul, conceived by him as "a simple substance" or thing. Precisely the same mistake is made by hosts of people who doubt because they cannot discover where the soul is and what it looks like.

But conversely effects can be known only when related to their causes; thoughts without a thinker are unintelligible, nonsensical. Ignoring this is the mistake of Hume and his followers, who interpret their thoughts as a "stream." Thoughts without a thinker are abstractions abstracted from nothing; they are like attributes without a substance or notions detached from moving things.

By thus reasoning, not in metaphors but in terms of cause and effect, we have certainly made some headway in disentangling the perplexities investing the subject of self-consciousness. But our task is but begun. Thoughts are dependent upon a thinker; but we have found them to be also dependent upon the spatial world. And it is needful to know something of the relation between these two factors which co-operate to produce human experience. Let us try to thus complete our theory.

The Antithesis of Feeling and Thought. The pivot of any true theory of consciousness, it seems to me, must be the following distinction: The process of feeling and that of thought are exactly antithetical. Feeling is automatic; its only function is to bind like to like according to the well known laws of Association; without conscious effort, by a process as purely mechanical as the growth of an organism, present sensations

are fused with past experiences. But thought, on the contrary, is a conscious effort to arrest this automatism, to rise above the mere spontaneity of suggestion, to abstract, to judge, to discover causal relations, instead of yielding to the blind, mechanical flow of associated feelings.

The tendency among experimental psychologists has been to ignore this antithesis, to see only resemblance between feelings and thoughts. M. Binet especially has shown, with great skill and power, the close parallelism between the structure of a syllogism and the fusion of present sensations with past images which is constantly taking place in all animal life. He wishes to prove the virtual identity of the reasoning process with this fusion of images; and yet he cannot wholly hide from himself their essential difference. This idle flow of associated images, as we see it in dreams or revery, making the oddest leaps and the queerest conjunctions, is certainly something very different from the steady, undeviating march of reason towards its conclusions. M. Binet confesses it with admirable candor. "How does it happen," he asks, "that these ideal recollections are not reasonings although they have their structure? To tell the truth, I do not know." (1).

The truth is that he has throughout his work

(1) Binet. *The Psychology of Reasoning*. 174.

mistaken the nature of logical inference. The syllogism is not, as the ancient Greeks imagined, the type of reasoning. On the contrary it is but a subsidiary process for interpreting and applying the knowledge already gained through induction. Its work is so entirely mechanical that machines can do it as unerringly as human minds. (1). There is no need, then, of being surprised at the close correspondence between the syllogism and the automatic process which Nature has devised for all animal sentiency.

Furthermore, this supposed analogy is very vague and far-fetched. But even if it were ten-fold closer, than it really is, it could not hide the opposition between thinking and the mere association of feelings. Thought dissolves what association unites; for the blind automatic suggestion of similarities it substitutes the search for causal relations. Almost every page of this essay has shown the opposition between the two processes.

The Functions of Consciousness. (1). This antithesis between thought and feeling is further proved by a scrutiny of consciousness. For, first, there would be no need of consciousness if thinking consisted merely in automatic or mechanical association. More than that it would be a positive impediment, preventing ease and rapidity of performance. Common experience shows that to

(1) Jevons. *Logic*. 199.

be true of all movements which at first have to be learned by conscious effort but afterwards become automatic or unconscious. But no one learns to think unconsciously. On the contrary, the more we keep every step of the process clearly and consciously before us, the better our thinking.

(2). Another most familiar fact is our experience of the immense *effort* required to really think. Despite our best endeavors the mind suddenly shoots off into some by-path of association. Children are notoriously thoughtless; and the vast majority of men soon give up the attempt to think as altogether too laborious. The reason is that to think requires a complete reversal of the natural tendency which we share with other animals. That tendency is to let our sensations and memories link themselves spontaneously together according to the mechanical laws of similarity.

(3). For the same reason thinking is never *continuous*. As finite beings, we are too easily swept off our feet by the under-tow of our animal existence. And therefore in its struggle against the blind automatism of the unconscious, thought requires the aid of language. Those who assert that there can be no thought without words are probably mistaken; at least it seems possible to perform some of the simplest acts of

judging or abstracting without the aid of speech. But evidently these acts are too volatile to avail much in the hard struggle of thought to maintain itself against the automatism of feeling. Therefore thought needs the aid of words, not merely for purposes of communication, but as symbols giving fixedness and persistence to our ideas, which are created with difficulty and vanish with ease into the stream of associated sensations and memories.

(4). This activity of thought *controls*, partially at least, the lower automatic activity, arrests it, reverses, reconstructs and transforms it. Constant experience proves this fact of control, and it is needless to enter here into the details of the proof. My design is to show that in this now completed view of the essential distinction—the contrariety, even—between thoughts and the stream of animal sentiency we have the first dawn of a scientific psychology.

The Basis of Psychology. For thousands of years the darkest of all dark questions has been that of the relation of the thinker to his thoughts. Even Oriental philosophy, otherwise a marvel of unity, split upon that point. And the chief source of this perplexity, apparently increasing instead of diminishing, seems to be the failure to inquire what thinking really is. That unknown, much knowledge concerning the thinker could hardly

be expected. Yet philosophy has never seriously propounded to itself the question: What is the nature, the essential function of thinking?

The result is that there has never been any precise line of demarcation drawn between the activities of the conscious self and those of the physical organism. Self has been vaguely conceived as some recollective force binding together the disconnected moments of experience. But animals also remember; even the minutest of the micro-organisms do. They seem to have other traces of consciousness also; they are aware of their pleasures and pains, they discriminate between spatial relations, they apparently exercise choice. (1) And if a single cell of protoplasm can accomplish all this, what specific function or reason for existence is left for the psychical self as distinguished from the physical organism?

But we have now established a precise line of demarcation, even an essential opposition between the activity of the conscious self and the stream of animal sentiency. This activity is revealed in all human experience as a transforming and, in a certain sense, creative power. It is the effort to control the mechanism of passivity, to convert sensations into reasoned perceptions, to exalt feeling into emotion, to transmute causes

(1) Binet. *The Psychic Life of Micro-organisms*, 63; 78, 109, et al.

into means and results into final causes, to create a cosmos within out of materials blindly provided from without. Such an activity is unknown to other animals, and of it, therefore, the physical organism cannot furnish even the hint of an explanation.

The agent of this unique activity, this effort to think, is the thinker, the will to know, the conscious self.

VII.

THE CONSCIOUS CAUSE.

We have already proved that the essence of modern scientific induction as distinguished from vulgar empiricism, consists in its new conception of force or energy as a causality acting with absolute invariability for the production of the motions of the universe. At first this conception was but a mere hypothesis. It was an exceedingly doubtful hypothesis also. Some phenomena manifested a certain degree of uniformity but the most seemed to show nothing but incessant variation. But with the discovery of the first two laws of motion this hypothesis began to be demonstrated little by little. And the whole gist of modern scientific progress may be said to lie in the gradual verifying of this hypothesis of invariability and the applying of it to ever widening circles of phenomena, until now it has become that universal law known as the Conservation of Energy.

But an enormous error has always dogged the heels of this great scientific movement. That error is the assumption that what has been demon-

strated concerning force or energy—causality conceived as limited to one unvarying mode of action—must be true concerning all causation; in other words, that such a limitation is somehow necessarily inherent in the very nature of a cause. This assumption pervades modern speculation through and through. It is the root of Kant's celebrated antinomies. It is pervasive in all nineteenth century idealism which, absorbed in the paradox of "phenomenality," lost all true idealistic insight into causality. And yet upon its very face it shows itself as an utterly unverifiable assumption. Certainly finite experience can never verify so vast a conclusion as that all causes are necessarily limited to one invariable manner of action. Even "intuition" cannot help us here; for that certainly cannot be a universal and necessary truth which had never been heard of three hundred years ago.

Evidently this assumption is another case of the fallacy of resemblance, of mere analogical reasoning. Just as forces are pictured as things somehow secreted within other things, so causality is pictured as something like these mystical forces and acting accordingly. But discarding all this, let us once more appeal to our Fundamental Law of Knowledge. Instantly two transparent and indubitable facts emerge.

The first fact is that there is nothing contradic-

tory in the idea of a dependent cause, of a thing that is a cause in one relation and an effect in another relation. Some philosophers have indeed marvelled over this, but it is hard to understand why. It seems no more mysterious than the fact that a man may be at once a father and a son.

The second and equally obvious fact is that every idea of a dependent cause has implicit in it the idea of an independent cause. Otherwise all causal relationship would be subverted. Mark further that this implicitness is not a mere hypothesis deduced through some difficult regress to the infinite. On the contrary, it is a fact evident upon bare inspection of inert things as science has taught us to regard them; it is made obscure only by that fallacy of resemblance which leads so many to conceive of forces as actual entities, like things and hidden inside of them.

The Theistic Argument. The above view, I think, shows the validity of the once famous "ontological argument" from the Idea of God to His Existence. That argument, insufficiently stated by the pre-scientific philosophy of the Middle Ages and much ridiculed since, is in its essence, profoundly true. Kant's witty criticism of it—that the idea of "a hundred thalers in my pocket" does not prove their actual existence there—has been received with unbounded applause. But,

really, the blinded Samson of modern philosophy was in that only making sport for the Philistines. His reply has no logical force; for, there is an utter disparateness between the two cases which he treats as analogous. The idea of God, of free, unlimited Causality, differs from all other ideas in this one respect, *that it is implicit in them all*. Therefore, if the idea of God is illusory, every other possible idea is also illusory—a mere shell of words enveloping a delusion. And if all ideas are illusory, nothing exists; all thinking suffers instant collapse. Thus we have again reached the logically impassable barrier which reason throws across the path to skepticism.

The ontological argument, therefore, despite all ridicule, will stand. Every thought of things or forces or of dependent causality in any other form, logically involves the thought of some free, uncoerced causality. Every act of true thinking, as distinguished from the merely spontaneous flow of associated feelings, has implicit in it the idea of God. Every such act of thinking is literally an act of worship.

The cosmological argument is but a corollary to the ontological one, rightly understood. The criticism against it may easily be traced back to the error considered in the first part of this section—the assumption that causality cannot be independent, but *must* always act with absolute in-

variability. Physical science has indeed proved that all motions follow, without a shadow of variableness, from their causes. But to assume that their primary cause must produce effects thus and only thus, is utter unreason. It is not only unwarranted, but it subverts the very idea of causality and thus makes all thinking impossible. In fine, it is the ubiquitous fallacy of resemblance again; merely imagining that causes must be like their effects, it argues that because the effects are necessitated, therefore their causes must also be necessitated. And yet upon this wanton assumption all pantheism reposes.

Analogy of Divine and Human Activity. We have before confessed—even boasted—that our conclusions were but the logical setting forth and verifying of what the human mind has always vaguely divined. This is pre-eminently true in regard to that argument from the analogy of divine and human activity upon which theistic faith has mainly rested and which even doubters, like Kant and Mill, have received with favor. That argument we fully accept; only we lift it from the level of a mere analogy to that of a true induction.

Induction, as we have seen, does not ignore difference and reason from mere resemblance alone. But it accounts for the difference, quantitatively if it can; and thus develops so far as pos-

sible the vague resemblance into sameness or identity. Let us follow this inductive method here. For the dim analogy between the making of a watch, for instance, and the creation of a universe, let us substitute that exact correspondence which science has discovered between divine and human thinking. "O God!" cried Kepler, "I think Thy thoughts after Thee." In other words there is no essential diversity or opposition between the finite and the infinite Reason. True, the former is interwoven with error; but that is because our human thinking is intermittent, difficult, yielding readily to lower impulses and suggestions, and thus ever lapsing into unreason. In fine, the difference is purely quantitative—the difference between the interrupted energy of the finite and the continuous, unlimited energy of the Infinite.

The Reign of Law. But there is a still closer correspondence between the activities of the human and the divine will. Both are the outcome of obedience to self-imposed laws of reason and righteousness. To speak of the Infinite as being compelled from without to yield such obedience, would be manifestly absurd. And that man also is very far from being compelled to yield this obedience, is too painfully evident from all his history. It is hardly needful to add that here also is the difference between the divine and the human

is purely quantitative. The conformity of the Infinite to moral law is continuous and eternal; that of man is fitful, interrupted by frequent lapses.

Note, however, that even these human variations do not in the least interfere with the universal reign of law. If man *thinks*—in what we have seen to be the only full and true sense of that term—he freely conforms to those higher laws upon which all the lower laws depend. If he ceases to think, if he does not will to control the mechanism of impulse and suggestion, he yields himself to the dominion of their mechanical laws. In either case, the reign of law is not for an instant broken.

